This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.055 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language, as appropriate, to reflect current boilerplate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1. Facility Name and Mailing Address: Sperryville STP, PO Box 253, Sperryville, VA 22740 — SIC Code: 4952 WWTP

   Facility Location: 3751 Sperryville Pike, Sperryville, VA 22740 — County: Rappahannock

   Facility Contact Name: Kenneth Thompson — Telephone Number: (540) 987-3185

2. Permit No.: VA0062880 — Expiration Date of previous permit: 8/30/2011

   Other VPDES Permits associated with this facility: None

   Other Permits associated with this facility: None

   E2/E3/E4 Status: Not Applicable

3. Owner Name: Rappahannock Water & Sewer Authority

   Owner Contact/Title: Kenneth Thompson, Director — Telephone Number: (540) 987-3185

4. Application Complete Date: April 6, 2011

Permit Drafted By:	Alison Thompson	Date Drafted:	June 3, 2011
Draft Permit Reviewed By:	Joan Crowther	Date Reviewed:	June 24, 2011
Draft Revised By:	Alison Thompson	Date Revised:	May 30, 2012
WPM Review By:	Bryant Thomas	Date Reviewed:	June 11, 2012
Public Comment Period :	Start Date:	End Date:	

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name :	Thornton River	Stream Code:	3-THO
Drainage Area at Outfall:	11.13 sq.mi.	River Mile:	22.15
Stream Basin:	Rappahannock	Subbasin:	None
Section:	4	Stream Class:	III
Special Standards:	None	Waterbody ID:	VAN-E05R
7Q10 Low Flow:	0.0 MGD	7Q10 High Flow:	0.73 MGD (Dec-May)
1Q10 Low Flow:	0.0 MGD	1Q10 High Flow:	0.59 MGD (Dec-May)
30Q10 Flow:	0.04 MGD	30Q10 High Flow:	1.32 MGD (Dec-May)
303(d) Listed:	No	30Q5 Flow:	0.10 MGD
TMDL Approved:	Yes (downstream)	Harmonic Mean Flow:	Undefined
Date TMDL Approved:	1/23/08 Bacteria		

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

- ✓ State Water Control Law
- ✓ Clean Water Act
- ✓ VPDES Permit Regulation
- ✓ EPA NPDES Regulation
- ✓ EPA Guidelines
- ✓ Water Quality Standards
- ___ Other

7. Licensed Operator Requirements: Class III

8. Reliability Class: Class II

9. Permit Characterization:

___	Private	___	Effluent Limited	___	Possible Interstate Effect
___	Federal	✓	Water Quality Limited	___	Compliance Schedule Required
___	State	___	Toxics Monitoring Program Required	___	Interim Limits in Permit
✓	POTW	___	Pretreatment Program Required	___	Interim Limits in Other Document
✓	TMDL				

10. Wastewater Sources and Treatment Description:

The Sperryville STP is a secondary treatment package plant with an adjacent equalization basin. The plant has soda ash and lime feed at the headworks, screening, two aeration basins, two clarifiers, and ultraviolet disinfection. The CTO for the UV system was received April 23, 2008. The effluent is aerated prior to discharge through the shore-based Outfall 001 to the Thornton River.

See Attachment 2 for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Domestic Wastewater	See Item 10 above.	0.055 MGD	**38° 39' 30"** N **78° 13' 10"** W
See Attachment 3 for (Washington Quad, DEQ #197B) topographic map.				

11. Sludge Treatment and Disposal Methods:

Sludge from the secondary clarifiers is held in the two holding tanks and is hauled to the Remington WWTP (VA0076805) for treatment.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge

TABLE 2	
3-TH0021.19	VADEQ Ambient Water Quality Monitoring Station on the Thornton River downstream at the Route 620 bridge.
3-THO014.37	VADEQ Ambient Water Quality Monitoring Station on the Thornton River downstream at the Route 626 bridge.
The Thornton River does not serve as a known source for potable water withdrawals.	

13. Material Storage:

TABLE 3 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Lime	20-30 Bags	Stored inside
Soda Ash	20-30 Bags	Stored inside

14. Site Inspection:

Performed by DEQ-NRO Water Compliance Staff on December 2, 2009. The Technical Inspection can be found in Attachment 4.

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

The nearest downstream DEQ monitoring station is located approximately 1.3 miles downstream of Outfall 001. Station 3-THO021.19 is located on the Thornton River at the Rt. 620 Bridge crossing. The following is the summary for this segment of the Thornton River, as taken from the Draft 2012 Integrated Report*:

For DEQ ambient monitoring station 3-THO021.19, at Route 620, the aquatic life, recreation, and wildlife uses are considered fully supporting. The fish consumption use was not assessed.

**The Draft 2012 Integrated Report (IR) has been through the public comment period and reviewed by EPA. The 2012 IR is currently being finalized and prepared for release.*

A segment of the Thornton River, beginning approximately 4.5 miles downstream of this facility is listed with a recreation use impairment due to exceedances of the *E. coli* criterion. Sufficient excursions from the maximum *E. coli* bacteria criterion (4 of 29 samples - 13.8%) were recorded at DEQ's ambient water quality monitoring station (3-THO014.37) at the Route 626 Bridge crossing to assess this stream segment as not supporting the recreation use goal for the 2012 water quality assessment.

b) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Thornton River, is located within Section 4 of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Attachment 5 details other water quality criteria applicable to the receiving stream.

Ammonia:
Staff has reviewed the maximum and minimum effluent data reported on the DMRs from January 2007 through February 2011 for pH (Attachment 5) and finds no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the previous permit. There is no new temperature data for this effluent. Therefore, the previously established pH and temperature values will be carried forward as part of this reissuance process. The annual effluent temperature is 24.3°C, the wet season temperature is 17.6°C, and the 90^{th} percentile pH is 7.7 S.U.

Default values were used for the stream since there is a very limited data set from the monitoring stations on the Thornton River. The default pH is 7.5 S.U., the annual temperature is 20°C, and the wet season temperature is 15°C.

Metals Criteria (except Copper):

The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/l calcium carbonate). Since the 7Q10 of the receiving stream is zero, the effluent data for hardness can be used to determine the metals criteria. A default value of 50 mg/L was used for the high flow stream hardness. The hardness-dependent metals criteria in Attachment 5 are based on an average effluent value of 165 mg/L from data collected from October 2006 to December 2010. The data can be found in Attachment 5.

Copper Criteria and the Water Effects Ratio Study:

During the 2001 reissuance, DEQ determined that limits were necessary for Total Recoverable Copper and Total Recoverable Zinc. Monitoring and a Schedule of Compliance were included in the 2001 permit. As part of the 2004 modification, Sperryville requested that the limits be reviewed based on the additional total hardness and metals data that were available for analysis. The analysis demonstrated that no limits were necessary for zinc, but that limits were still necessary for copper. During the modification, the limit was revised from 6 ug/L to 20 ug/L with monitoring set at 1/3M.

The facility has reported exceedances to the Total Recoverable Copper limitations and was referred to DEQ-NRO Enforcement. As part of the Consent Special Order, Sperryville pursued a Water Effects Ratio (WER) streamlined study for copper. The study followed EPA guidance for a Streamlined Water Effect Ratio Procedure for the Discharges of Copper (EPA 822-R-01-05). The Final Streamlined WER Report was submitted to DEQ on November 29, 2010. DEQ's Water Quality Standards Staff reviewed the submitted document in May 2011 and forwarded the study to EPA for review. In May 2012, DEQ received notice from EPA that given the way that Virginia adopted the metals criteria incorporating a WER into the criteria formulas, and EPA has approved the criteria as part of the Virginia Water Quality Standards, that EPA has no official need to review and approve individual WER values. The DEQ review memorandum dated May 2012 can be found in Attachment 5 with the calculation of the Water Quality Criteria. A summary of the calculated Copper WQC is found below.

Per 9VAC25-260-140F, the formulas for the freshwater acute and chronic criteria (µg/L) for copper utilize a default WER value of 1.0 unless shown otherwise.

Acute Criteria

$$WER \times [e^{\{0.9422[\ln(hardness)]-1.700\}}] \times (CF_a)$$

Where $CF_a = 0.96$

Chronic Criteria

$$WER \times [e^{\{0.8545[\ln(hardness)]-1.702\}}] \times (CF_c)$$

Where $CF_c = 0.96$

A Wasteload Allocation analysis was conducted using the average receiving stream hardness of 50 mg/L and an average effluent hardness of 165 mg/L (Attachment 5). The following acute and chronic copper Waste Load Allocations (WLAs) were calculated.

Acute WLA	Chronic WLA
22 µg/L	14 µg/L

Because the formulas for the freshwater acute and chronic criteria (µg/L) for copper utilize a default WER value of 1.0, the above WLA were multiplied by the WER value of 7.078. The following acute and chronic copper criteria were derived for the Sperryville WWTP.

Acute Criteria	Chronic Criteria
156 µg/L	99 µg/L

Bacteria Criteria:
The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[1]For a minimum of four weekly samples [taken during any calendar month].

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Thornton River, is located within Section 4 of the Rappahannock River Basin. This section has been designated with no special standards.

d) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on April 13, 2011, for records to determine if there are threatened or endangered species in the vicinity of the discharge. No threatened or endangered species were identified The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge. The printout of the DGIF search is located in the reissuance file.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The treatment plant was constructed before adoption of the Virginia Water Quality Standards on March 30, 1992, and the wasteload allocations and effluent limitations were established to meet the water quality standards. Additionally, field biological monitoring staff have observed filamentous algae in the Thornton River through the Sperryville area, both upstream and downstream from the discharge from the wastewater treatment plant, and biological monitoring in town indicates the receiving stream meets water quality standards but does not exceed standards. It is staff's best professional judgment that this receiving stream is a Tier 1 water body in the location of the discharge. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:
Effluent data obtained from the DMRs has been reviewed and determined to be suitable for evaluation. Effluent data were reviewed from January 2008 to the present; the facility has reported exceedances of the Total Recoverable Copper limitations and the Ammonia as N limitations. See Section 27 of the Fact Sheet for a summary of the Consent Special Order.

The following pollutants require a wasteload allocation analysis*:* Ammonia as N and Total Recoverable Copper.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the C_o.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

While the previously established pH and temperature values were used to re-calculate ammonia criteria, the ammonia criteria for this reissuance differ from those criteria established with the 2001 reissuance due to changes in Water Quality Standards. Re-calculation of the ammonia criteria based on the new Water Quality Standards yields less stringent criteria and less stringent limits:

2001 Reissuance				
Ammonia as N:	WLA Acute	12.42 mg/L	WLA Chronic	3.71 mg/L
	Monthly Average limit (June-Nov):	5.1 mg/L		
2011 Reissuance				
Ammonia as N:	WLA Acute	14.0 mg/L	WLA Chronic	4.1 mg/L
	Monthly Average limit (June-Nov):	5.6 mg/L		

Although the new criteria would support relaxed effluent limits, staff has no basis to allow backsliding. Changes in regulation are specifically excluded as a basis for backsliding.

The data and assumptions made during the 2001 reissuance are still presumed to be correct, therefore, the previous Ammonia as Nitrogen limit will be carried forward as part of this permit reissuance.

Evaluations show that no limit is necessary from December through May.

The limit derivations are found in Attachment 6.

2) Total Residual Chlorine:

Chlorine limitations are no longer necessary because the facility now utilizes UV disinfection.

3) Copper:

Staff utilized effluent Copper data for the years 2008, 2009, and 2010 to determine the need for Copper limitations using the newly calculated WQC with the WER adjustment. The evaluation demonstrates that no limits are necessary for Copper; therefore, the existing Copper limitations shall be removed from the permit.

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), and pH limitations are proposed.

Dissolved Oxygen and BOD_5 limitations are based on the stream modeling conducted August 1, 1975 (Attachment 7) and are set to meet the water quality criteria for D.O. in the receiving stream.

It is staff's practice to equate the Total Suspended Solids limits with the BOD_5 limits. TSS limits are established to equal BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Flow, BOD_5, Total Suspended Solids, Ammonia as N, pH, Dissolved Oxygen, and *E.* coli.

The limit for Total Suspended Solids is based on Best Professional Judgement.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). This permit requires influent BOD and TSS monitoring on an annual basis to demonstrate 85% removal.

18. Antibacksliding:

All limits in this permit except for Total Recoverable Copper are at least as stringent as those previously established. Backsliding does not apply.

The Total Recoverable Copper limits were removed as part of this reissuance based on the updated total hardness and effluent data provided as part of the reissuance package and based on the results of the Water Effects Ratio Study conducted by the facility. The backsliding proposed conformed to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, 9 VAC 25-31-220.L., and 40 § CFR 122.44. The copper limits are water quality based effluent limits. The revisions to the limits are allowed since the revisions comply with the water quality standards 402(o)(3) and they are consistent with antidegradation 303(d)(4)(B).

19. Effluent Limitations/Monitoring Requirements:

Design flow is 0.055 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	1, 5	30 mg/L 6.2 kg/day	45 mg/L 9.4 kg/day	NA	NA	1/W	4H-C
Total Suspended Solids (TSS)	2	30 mg/L 6.2 kg/day	45 mg/L 9.4 kg/day	NA	NA	1/W	4H-C
Dissolved Oxygen	3, 5	NA	NA	6.0 mg/L	NA	1/D	Grab
Ammonia, as N (Jun-Nov)	3	5.1 mg/L	7.5 mg/L	NA	NA	1/W	4H-C
E. coli (Geometric Mean)	3	126 n/100mls	NA	NA	NA	1/W	Grab
Influent BOD	1	NL	NL	NA	NA	1/YR	Grab
Influent TSS	1	NL	NL	NA	NA	1/YR	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 7

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
TIRE = Totalizing, indicating and recording equipment.

1/D = Once every day.
1/W = Once every week.
1/YR = Once every year.

4H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the Monitored 4-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of four (4) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum four (4) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by =10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

20. Other Permit Requirements:

a) Part I.B. of the permit contains quantification levels and compliance reporting instructions. 9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a) 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.

b) Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1. and B.2. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

f) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class III operator.

g) Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.

h) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

i) Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

j) Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2., and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
   1) The Nutrient Enriched Waters Reopener was removed.
   2) The O&M Manual Special Condition was updated.

b) Monitoring and Effluent Limitations:
   1) The nutrient monitoring included during the last reissuance has been removed – TKN, Nitrate+Nitrite, Total Nitrogen, Total Phosphorus, and Orthophosphate. When the facility plans an expansion, they will be subject to expanded Total Nitrogen and Total Phosphorus monitoring and annual average limitations.
   2) The Total Residual Chlorine effluent monitoring was removed since the facility now utilizes UV disinfection.
   3) Annual influent BOD and TSS monitoring were included since the facility's BOD and TSS limitations are 30 mg/L for the monthly averages.
   4) The effluent limits for Copper were removed based on the new hardness data and the results of the Water Effects Ratio Study.
   5) Total Hardness monitoring was removed since Copper limits are no longer included.

24. Variances/Alternate Limits or Conditions:

None

25. Public Notice Information:

First Public Notice Date: Second Public Notice Date:

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 8 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

There is a listed recreation impairment downstream of this facility. A segment of the Thornton River, beginning approximately 4.5 miles downstream of this facility is listed with a recreation use impairment due to exceedances of the E. coli criterion. Sufficient excursions from the maximum *E. coli* bacteria criterion (3 of 25 samples - 12.0%) were recorded at DEQ's ambient water quality monitoring station (3-THO014.37) at the Route 626 bridge crossing to assess this stream segment as not supporting the recreation use goal for the 2010 water quality assessment.

A bacteria TMDL has been completed for the Hazel Run watershed. The Thornton River was not specifically in included in the TMDL, but all upstream facilities were accounted for during TMDL development. This facility has a WLA of 9.58E+10 cfu/yr of *E. coli.* The Hazel Run watershed bacteria TMDL was completed and approved by EPA on 01/23/08.

In support for the PCB TMDL that will be developed for the tidal Rappahannock River by 2016, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor municipal facility. Low-level PCB analysis uses EPA Method 1668B, which is capable of detecting low-level concentrations for all 209 PCB congeners. The Assessment/TMDL Staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is located in the headwaters of the Rappahannock River watershed and has a discharge of less than 0.1 MGD. Based upon this information, this facility will not be requested to monitor for low-level PCBs.

There is a completed downstream TMDL for the nutrient impairments for the Chesapeake Bay. The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. This facility received an allocation based on its current design flow. No specific nutrient concentration limitations are included at this time. If in the future the facility expands, the VPDES permit shall include specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

27. Additional Comments:

Previous Board Action(s): The Sperryville STP was referred to Enforcement for exceedances to the established Total Recoverable Copper limitations during six monitoring periods during 2008 and 2009 and for exceedances of Ammonia as N limitations in November 2008. A copy of the Consent Special Order (CSO) can be found in Attachment 9. As part of the CSO, the facility performed a Streamlined Water Effects Ratio (WER) Study for Copper. The final report for the WER was submitted on November 29, 2010.

Water Effects Ratio Study: As part of the Consent Special Order, Sperryville pursued a Water Effects Ratio (WER) streamlined study for copper. The study followed EPA guidance for a Streamlined Water Effect Ratio Procedure for the Discharges of Copper (EPA 822-R-01-05). The Final Streamlined WER Report was submitted to DEQ on November 29, 2010. DEQ's Water Quality Standards Staff reviewed the submitted document in May 2011. DEQ's Water Quality Standards Staff forwarded the study to EPA for review in late May 2011. In May 2012, DEQ received notice from EPA that given the way that Virginia adopted the metals criteria incorporating a WER into the criteria formulas, and EPA has approved the criteria as part of the Virginia Water Quality Standards, that EPA has no official need to review and approve individual WER values. The review memorandum can be found in Attachment 5 with the calculation of the Water Quality Criteria.

Staff Comments: The reissuance of this permit was delayed due to the review necessary for the Water Effects Ratio Study.

Public Comment:

EPA Checklist: The checklist can be found in Attachment 9.

Receiving Stream Inspection: Site and stream inspections were conducted on October 28, 2004 as part of the permit modification. The stream characteristics are summarized here since they were considered during the development of the ammonia and copper effluent limitations.

> The Thornton River was first inspected approximately 1.5 miles upstream of the STP. The River is within the boundaries of the National Park at this point. The stream was approximately 20 feet wide and was estimated to be about 10 feet wide and 2-4 inches deep during 7Q10 conditions. The ratio of pools to riffles during 7Q10 conditions was estimated at 50:50. The streambed consisted of small rocks and the river meanders moderately. The Thornton River flows down the mountain, through the Town of Sperryville, and past the Town's Sewage Treatment Plant.
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> We next looked at the River at the outfall for the STP. The outfall is a headwall built into the stream bank. The Thornton River at the outfall is shallow and is estimated to be approximately 10 feet wide and 2 inches deep during 7Q10 conditions. About 30 feet downstream of the discharge location, the river has a large riffle zone and at about 100 feet downstream, the river makes an approximate 45° bend to the right. The bottom is rocky, and caddis flies and water pennies were noted attached to the bottom of rocks.
>
> The final stream inspection occurred at the confluence of the Thornton River with the North Fork Thornton River. The confluence is approximately 0.3 miles downstream of the outfall. The Thornton River widens after the confluence and it is about 50 feet from bank to bank. The streambed is rocky.